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LEAF-MINING LEPIDOPTERA (NEPTICULIDAE, BUCCULATRICIDAE, GRACILLARIIDAE) FROM *ULMUS* IN NORTHERN CASPIYA (KASPIA)

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Three leaf-mining species from elm (*Ulmus carpinifolia* Rupp. ex Suckow): *Stigmella kazakhstanica* Puplesis sp. n. (Nepticulidae), *Bucculatrix caspica* Puplesis & Sruoga sp. n. (Bucculatricidae) and *Phyllonorycter schreberella* (F.) (Gracillariidae) are recorded from the northern Caspiyan region (USSR). The new species are described, genitalia and mines are illustrated. *Phyllonorycter schreberella* (F.) is diagnosed and its male genitalia are figured.
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Keywords. – Nepticulidae; Bucculatricidae; Gracillariidae; leaf-mining Lepidoptera; northern Caspiya.

The large northern Caspiyan (=Kaspian) region is generally characterized by a strong continental climate and by arid landscapes. Except oases by the rare rivers and settlements, there are only dry steppes, semideserts and deserts. The abundance of salt lakes, saline soils (solanchaks and solonetzes) is very characteristic. The vegetation of most of these biotopes is extremely poor, usually without woody plants. Grass cover is thin, the vegetation consists mainly of different worms-woods (*Artemisia* spp.) and cereals, with worm-woods dominating. The sum of active temperature equals 2800-3400 °C with a wetting coefficient of 0.15-0.10 (Tushinskij & Davydova 1976).

In oases near the settlements the elm (*Ulmus carpinifolia* Rupp. ex Suckow) is the dominating tree. In a few cases it is the only tree present.

Hardly any published data on leaf-mining Lepidoptera were available from these regions. Only one *Stigmella* (Nepticulidae) specimen deposited in the Zoological institute (Leningrad), reared by G. Lindeman from *Ulmus* sp., from Dzhanibek (Western Kazakhstan), was known. It belongs to a new species.

During investigations in early August 1988 in the localities (fig. 1) Baskunschak (Astrakhan Region), Gurjew (Gurjew Region), Beyneu (Mangyschlak Region), Kara-Kalpakiya and Kungrad (Kara-Kalpakskaya ASSR), mines of three leaf-mining Lepidoptera were discovered. *Bucculatrix caspica* Puplesis & Sruoga sp. n. was found in the largest numbers. Numerous cocoons and empty mines were collected from *Ulmus carpinifolia* in all investigated localities, Gurjew and Kungrad. Our later study of 1988 in neighboring Turkmeniya showed its absence from the Central Asiatic part of the USSR. Abundant mines of *Phyllonorycter schreberella* (F.), containing larvae or pupae were collected on *Ulmus carpinifolia* in Baskuntschak. In other places of the Caspiyan region, this species remains yet unrecorded. One empty mine of Nepticulidae was found on *Ulmus carpinifolia* in Baskuntschak, i. e. about 140 km South of Dzhanibek, where the above mentioned *Stigmella* specimen on *Ulmus* sp. was collected by Lindeman in 1966. It is therefore considered to belong to the same species. *Ulmus* spp. (including *U. carpinifolia* Rupp. ex Suckow) are known to be host plants for Gracillariidae (Kuznetzov 1981), Bucculatricidae (Seksjaeva 1981) and Nepticulidae (Johansson & Nielsen 1990).

No other lepidopterous miners on other plants have been found in this region.

The type specimens are deposited in the collection of the Minological research laboratory at the Department of Zoology of the Pedagogical insti-

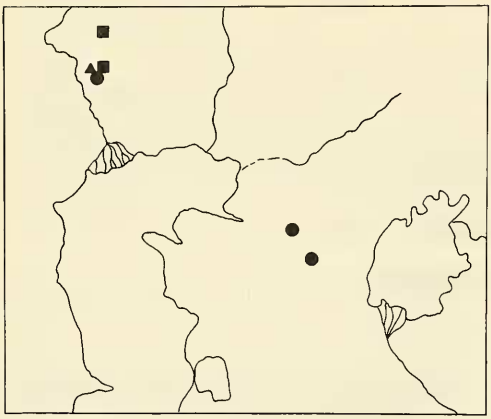

Fig. 1. Distribution map of leaf-mining Lepidoptera in northern Caspiya: *Stigmella kazakhstanica* (rectangles), *Bucculatrix caspica* (dots), *Phyllonorycter schreberella* (triangle).

tute, Vilnius, Lithuania (MRL) and in the collection of the Zoological institute of the USSR Academy of Sciences in Leningrad (ZIAS).

TAXONOMIC PART

Nepticulidae

Stigmella kazakhstanica Puplesis sp. n.
(figs. 1-3)

Type material. – Holotype ♂: USSR, western Kazakhstan (Kazakh SSR), Dzhanibek, larva on leaf of *Ulmus* sp. (probably *U. carpinifolia*), vi.1966, leg. G. Lindeman (ZIAS). Leaf-mine (no type material): USSR, Astrakhan Region, Baskuntschak, on *Ulmus carpinifolia*, fresh mine, 4.viii.1988, leg. R. Puplesis et V. Sruoga (MRL).

Diagnosis. – Belongs to the *Stigmella ulmivora* group. It is very similar to *S. ulmiphaga* (Preissecker) and *S. ulmivora* (Fologne). In the male genitalia it is easily distinguished by the valvae, which are abruptly broadened at the base. Cornuti not numerous, lateral lobes of vinculum broad in contrast to *S. ulmivora* (Johansson & Nielsen 1990).

Description

Male. – Frontal tuft pale orange. Antennae pale brown. Eye-caps and collar cream. Palpi cream. Thorax and forewings uniform, greyish brown. Cilia and hindwings approximately as forewings in colour.

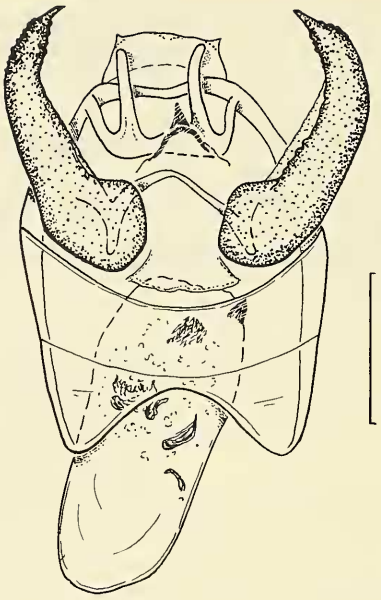

Fig. 2. Male genitalia of *Stigmella kazakhstanica*, holotype (scale 0.1 mm).

Fig. 3. Mine of *Stigmella kazakhstanica* on *Ulmus* sp., from which the holotype was reared.

Female unknown.

Male genitalia (fig. 2). – Valva narrow medially and apically, strongly broadened basally. Transtilla with short sublateral processes. Juxta present, its form resembles a triangle apically. Uncus approximately with trapezium shape, with slightly tapering angles. Gnathos with two thin and long posterior processus. Transverse bar of gnathos narrow. Aedeagus narrowing in middle (in lateral view). Vesica with two groups of cornuti; one of which is larger and situated in middle, a smaller group is situated apically. Cornuti more or less in form of sclerotized spines, some cornuti have different forms.

Biology. – Larvae in June and August, mining leaves of *Ulmus carpinifolia* Rupp. ex Suckow. Mine a contorted gallery (fig. 3). Early mine completely filled with brownish frass; later gradually widening with frass coiled, leaving wide clear margins; finally frass in a dark narrow line.

Distribution (fig. 1). – Only known from the lower Volga valley.

Bucculatricidae

Bucculatrix caspica Puplesis & Sruoga sp. n. (figs. 1, 4-8)

Type material. – Holotype ♂: USSR, Astrakhan Region, Baskuntschak, N 4170, cocoon on leaf *Ulmus carpinifolia*, 4.viii.1988, ex p. 7.viii.1988. Paratypes: 1 ♂, 1 ♀, same data as holotype, ex p. 7-15.viii.1988; 1 ♂, same locality, caught on leaf of *Ulmus carpinifolia*, 4.viii.1988, leg. R. Puplesis and V. Sruoga (MRL). Leaf-mines (no type material): Mangyschlak Region, Beyneu; Kara-Kalpakskaya ASSR, Kara-Kalpakiya.

Diagnosis. – This species is similar to the European *B. ulmella* Zeller (Seksjaeva 1981) (on *Quercus*) and the neartic *B. electa* Braun which also feeds on *Ulmus* leaves (Braun 1963). *B. caspica* is easily recognized by its male genitalia with a long vinculum, the presence of a transtilla and the form of the valvae.

Description

Male (fig. 4). – Forewing length 2.9-3.1 mm. Face creamy white, tuft brown or brownish in central part, with creamy white piliform scales laterally. Eye-caps creamy white. Antennal flagellum with alternating white and brown rings of equal width. Thorax creamy white, slightly mottled, as some scales have brownish tips. Forewing with same colour as thorax, but some brown spots are present. Three or four of these spots are situated on the costal margin, the two below the fold, in apical part of forewing are smaller and usually darker. They include patches of blackish-brown scales. Dark-tipped scales form a line on the pale creamy cilia. Hindwings and cilia greyish cream to pale brownish. Legs cream with little fuscous shading.

Female. – Forewing length about 3.3 mm. Similar to male, but face cream, tuft slightly brownish centrally. The spots on the forewing may be larger than in male.

Male genitalia (fig. 5). – Valva with convex margin medially, suddenly tapering apically. Many large and some short setae on apical and medial part of valva. Transtilla present. Anellus forming an asymmetric ring. Uncus with two large lateral setosae lobes. Vinculum ventrally a large, more or less triangular lobe, rounded anteriorly. Aedeagus long and slightly bent basally.

Female genitalia (fig. 6). – Apophyses posteriores long. Ductus bursae narrow and very long. Bursa copulatrix more or less oval with numerous small spines.

Egg. – Laid on the underside of a leaf of *Ulmus carpinifolia* Rupp. ex Suckow, generally close to the midrib or a lateral vein. In some cases, eggs are laid away from veins.

Mine (fig. 8). – Gallery very narrow and comparatively long (18-20 mm) with black linear frass, leaving clear margins throughout its whole course.

Cocoon (fig. 7). – Whitish cream with blackish perpendicular patterns.

Distribution (fig. 1). – Probably widespread in northern Caspiya, but possibly absent from the Amudar'ya oases and Turkmeniya.

Gracillariidae

Phyllonorycter schreberella (Fabricius) (fig. 9)

Diagnosis. – It belongs to the *Phyllonorycter ulmifoliella* group, which larvae are usually leafminers of *Ulmus* (Kuznetzov 1981). It is easily recognized from all other species in that group by the silvery shining frons, thorax and base of the forewings. Tuft on head black. Forewing with two silver fasciae basally and medially, two silver spots apically. There is a black spot on base of forewing, near costal margin. Male genitalia (fig. 9) differs from all other species of the genus by the narrow and bent valvae.

Distribution (fig. 1). – *P. schreberella* is found in Europe from England and Scandinavia to the Balkans and the European part of the USSR, also in Asia Minor, the Caucasus and the mountains of Turkmeniya (Kopet-Dag ridge) (Kuznetzov 1981). The species is here recorded for the first time from the northern Caspiyan region.

Material examined. – 2 ♂, 1 ♀, USSR, Astrakhan region, Baskuntschak, mines 4.viii.1988, ex p. 7.viii.1988, leg. R. Puplesis and V. Sruoga (MRL).

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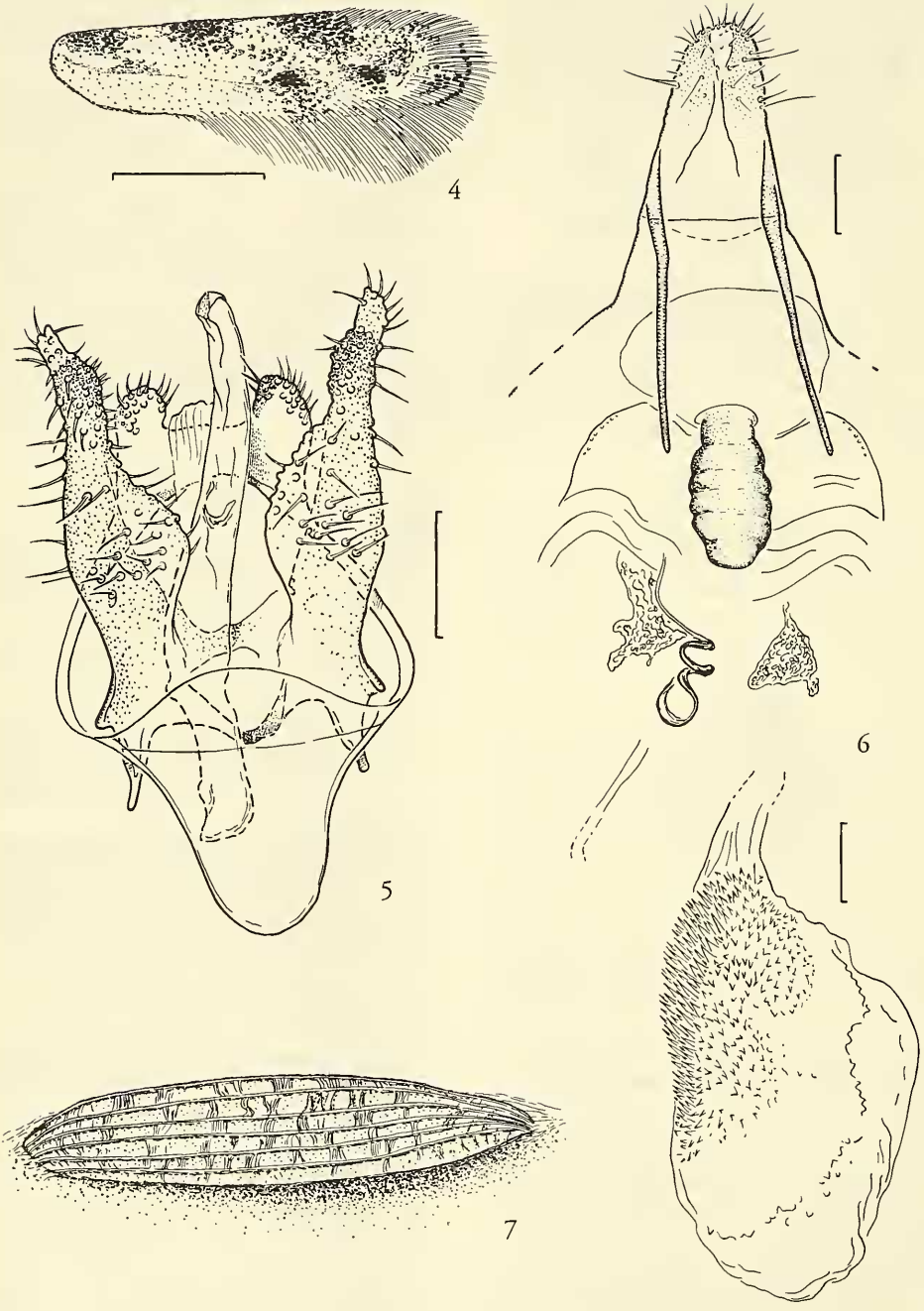

Fig. 4-7. *Bucculatrix caspica*. – 4, forewing (scale 1 mm); 5, male genitalia, holotype (scale 0.1 mm); 6, female genitalia, paratype (scale 0.1 mm); 7, cocoon, from type locality.

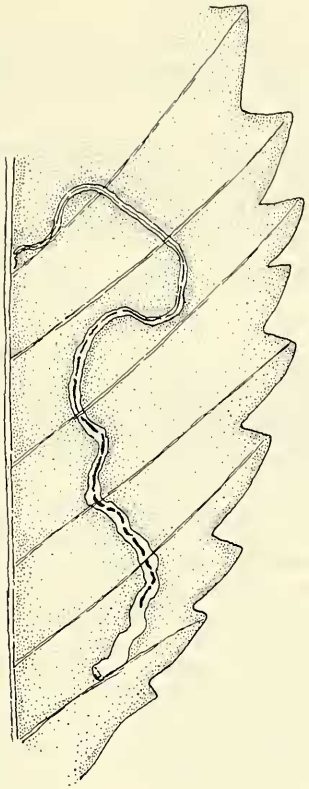

Fig. 8. Mine of *Bucculatrix caspica* on *Ulmus carpinifolia*.

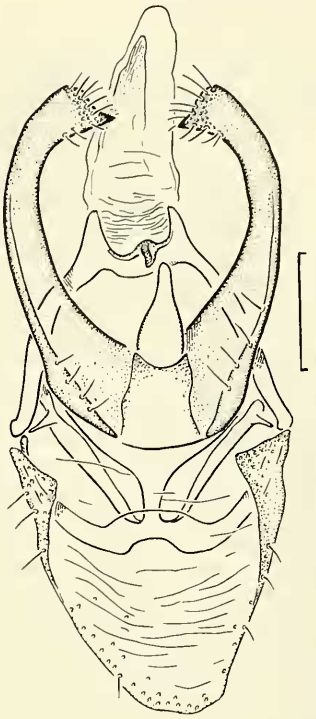

Fig. 9. Male genitalia of *Phyllonorycter schreberella* (F.) (scale 0.1 mm).

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